

What is claimed is:

1. An anti-glare film having rough surface of which  $R(0)$  is 1% or less, and  $R(30 \text{ or more}) / R(0)$  is 0.001 or less,

wherein  $R(0)$  is the regular reflectance along the regular reflection direction against incidence light at any angle from  $5$  to  $30^\circ$  from the normal line of said anti-glare film and

$R(30 \text{ or more})$  is the reflectance against said incidence light, along a direction inclined by  $30^\circ$  or more toward said anti-glare film side from said normal reflection direction.

2. The anti-glare film according to Claim 1, wherein the  $60^\circ$  reflection definition is 200% or less.

3. The anti-glare film according to Claim 1 or 2, wherein

the roughness of the surface is divided into unit cells having a plurality of irregularities,

the irregularities constitute mutual translational symmetry with irregularities in other unit cells, and

the average value of minimum distances between peaks of said irregularities ( $m_1$ ), and the standard deviation of said minimum distances ( $\sigma_1$ ), in said unit cells, satisfies

the following formula:

$$0.05 \leq \sigma_1/m_1 \leq 0.3$$

4. A method of producing an anti-glare film according to any of Claim 1, comprising

a step of performing gradient exposure on a photo-resist formed on a base material, a step of conducting development on to form roughness on said photo-resist,

a step of electro-casting a metal on said photo-resist,

a step of peeling said metal from said photo-resist to produce a metal plate transferred the roughness, and

a step of transferring said roughness onto a film using said metal plate.

5. The method of producing an anti-glare film according to Claim 4, wherein

the step of transferring said roughness comprises a step of winding said metal plate on the surface of a roll to produce an emboss roll having said roughness on its surface, and a step of continuously transferring said roughness onto a film using said emboss roll.

6. The method of producing an anti-glare film

according to Claim 4 or 5, wherein

the step of performing gradient exposure is conducted by performing proximity exposure at least via a photo-mask of two gradients on said photo-resist, and

the distance between said photo-mask and said photo-resist ( $L \mu m$ ) and the outer dimension of transmission portions of said photo-mask ( $D \mu m$ ) satisfies the following formula:

$$1.3 \leq L/D^2 \leq 2.8$$

7. The method of producing an anti-glare film according to Claim 4 or 5, wherein the step of performing gradient exposure is conducted at least via a photo-mask of multi gradients on said photo-resist.

8. The method of producing an anti-glare film according to Claim 4 or 5, wherein the step of performing gradient exposure is conducted by using a space light modulation element capable of changing the light intensity of an exposure light source with at least the location on said photo-resist.

9. A display equipped with an anti-glare film according to Claim 1.

ANTI-GLARE FILM, METHOD OF PRODUCING THE SAME, AND DISPLAY  
EQUIPPED WITH THE SAME

Abstract

The present invention provides an anti-glare film having rough surface of which  $R(0)$  and  $R(30 \text{ or more}) / R(0)$  are 1% or less and 0.001 or less, respectively,

wherein  $R(0)$  is if the regular reflectance along the regular reflection direction against incidence light at any angle from 5 to  $30^\circ$  from the normal line of said anti-glare film and

$R(30 \text{ or more})$  is the reflectance against said incidence light, along a direction inclined by  $30^\circ$  or more toward said anti-glare film side from said normal reflection direction. And the present invention also provides the method of producing the above-mentioned anti-glare film.